

### CROSS-REFERENCE TO RELATED APPLICATIONS

5 This is a Continuation-In-Part of U.S.  
application Serial No. 09/257,896, filed February 25,  
1999 <sup>ABN</sup>, which is a Continuation-In-Part of U.S.  
application Serial No. 08/623,569, filed March 28,  
1996 <sup>PAT 6,017,143</sup> and this application is also a Continuation-In-  
10 Part of U.S. application Serial No. 09/383,828, filed  
August 27, 1999 <sup>PAT 6,654,697</sup>

15 The present invention relates to fluid process control systems. In particular, the present invention relates to diagnostic systems for fluid flow in process control systems.

20 Fluid flow meters are used in industrial process  
control environments to measure fluid flow and provide  
flow signals for flow indicators and controllers.  
Inferential flow meters measure fluid flow in a pipe  
by measuring a pressure drop near a discontinuity  
25 within the pipe. The discontinuity (primary element)  
can be an orifice, a nozzle, a venturi, a pitot tube,  
a vortex shedding bar, a target or even a simple bend  
in the pipe. Flow around the discontinuity causes both  
a pressure drop and increased turbulence. The pressure  
30 drop is sensed by a pressure transmitter (secondary  
element) placed outside the pipe and connected by  
impulse lines or impulse passageways to the fluid in  
the pipe. Reliability depends on maintaining a correct